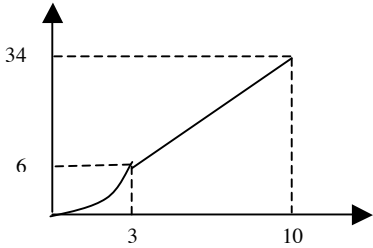


**Assessment Schedule 2008****Science: Describe aspects of physics (90191)****Evidence Statement**

Question	Achievement	Achievement with Merit	Achievement with Excellence
ONE (a)	<b>Correct solution</b> $V = IR$ $= 2 \times 2$ $= 4 \text{ V}$		
(b)		<b>Correct solution</b> $P = VI$ $= 4 \times 2$ $= 8 \text{ W}$ (possible follow-on from (a))	
(c)	<b>ONE</b> correct statement of <ul style="list-style-type: none"> <li>Resistance of lamp B is higher than A.</li> <li>Voltage is higher in B than in A.</li> <li>A and B both have the same current.</li> <li>Lamp B has a higher power output.</li> </ul>	<b>Achieved plus explains how they know</b> <ul style="list-style-type: none"> <li>Higher <math>R</math> leads to more work/energy transformed through lamp.</li> <li>Higher <math>R</math> leads to greater voltage across lamp.</li> <li>Higher <math>V</math> therefore more energy is transformed into light.</li> <li>(Same current and) higher <math>V</math> therefore higher <math>P</math>.</li> <li>(Same current and) higher <math>R</math> therefore higher <math>P</math>.</li> </ul>	<b>Merit plus reason based on R, I, V and P</b> Eg Higher resistance of B leads to a greater voltage, and as it receives the same current leads to greater power output than lamp A.  MUST be clear that higher $R$ leads to higher $V$ .
(d)	Current decreases OR Total resistance increases OR States $R = 8 \Omega$	Explains that current decrease is DUE TO an increase in total resistance of circuit.	
(e)		EITHER Correctly calculated current/value $I = P / V$ $= 36 / 12$ $= 3$ OR Incorrectly calculated current correctly substituted into $R = 12 / I$ NB: <b>Must</b> clearly show what they are calculating	<b>Correct solution</b> $I = P / V$ $= 36 / 12$ $= 3 \text{ A}$  $R = V / I$ $= 12 / 3$ $= 4 \Omega$
(f)		<b>Correct solution</b> $W = P t$ $= 36 \times 30$ $= 1080 \text{ J}$	

TWO (a)	<b>Correct solution</b> $v = d / t$ $= 6 / 3$ $= 2 \text{ ms}^{-1}$		
(b)	<b>Correct solution</b> $E_k = \frac{1}{2}mv^2$ $= \frac{1}{2} \times 0.4 \times 4^2$ $= 3.2 \text{ J}$		
(c)	BOTH lines correct. 		
(d)	<b>ONE correct statement relating to unbalanced force</b>  Friction is greater. OR Push is less. OR Less traction /grip on sand (or vice versa). OR Net force does not equal zero. OR An unbalanced force is created.	<b>Explains that unbalanced force is in opposite direction to motion</b>  Friction greater than push force (leading to a deceleration). OR Net force is now negative resulting in a decrease in speed.	<b>Fully explained answer. (Merit plus gives the cause of the unbalanced force)</b>  Eg: Sand causes less traction / grip this leads to a reduced push force. OR Sand creates “bulge” increasing the friction. OR Car sinks into sand increasing friction.  PLUS More friction than push causes an unbalanced force which leads to a change in speed. Net force is negative causing a deceleration.
(e)	<b>Correct unit.</b> Newton, N	EITHER Correctly calculated acceleration $a = \frac{\text{rise}}{\text{run}} = \frac{4-0}{3-0} = 1.33 \text{ m s}^{-2}$ OR Incorrectly calculated acceleration substituted into $F = ma$ Note: Must show what they are calculating. OR Correct solution INCORRECT or NO unit.	<b>Correct solution and unit.</b>  $a = \frac{\text{rise}}{\text{run}} = \frac{4-0}{3-0} = 1.33 \text{ m s}^{-2}$  $F = ma = 0.4 \times 1.33$ $= 0.53 \text{ N}$

THREE	<p><b>Correct statement</b></p> <p>Conduction is the process whereby heat is transferred by the vibration of particles.  OR  An insulator prevents the conduction of heat.  OR  Air is a good insulator.  OR  Heat conducts / passes through joists.  OR  Insulation below joists prevents heat loss through joists or vice versa.</p>	<p><b>Describes either a conduction or insulation in terms of particles plus links this correctly to the situation given.</b></p> <p>Conduction is the process whereby heat is transferred by the vibration of particles. The insulation prevents the heat from conducting through joists.  OR  Conduction is the process whereby heat is transferred by the vibration of particles. The joists will conduct as they are solid / particles close together.  OR  Conduction is the process whereby heat is transferred by the vibration of particles. Air is an insulator preventing heat loss from the floor as it is a gas / particles are far apart.  OR  Air is an insulator as it is a gas with its particles far apart. This means that heat cannot be easily transferred by vibration through it / it will not conduct heat through it.</p>	<p><b>COMPARES both diagrams plus describe the process of conduction (in terms of particles) AND explains why the air gap is present.</b></p> <p>Conduction is the process whereby heat is transferred by the vibration of particles. Air is an insulator as (the particles are far apart) therefore the air gap prevents conduction. In the joists, heat can be conducted through (as they are made of a solid with particles close together). By placing the blanket at the base of the joists in diagram one, heat loss is reduced out of the end of the joists. However, in diagram two the ends are exposed allowing heat to be lost through them.</p>
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### Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
<p>Total of SEVEN opportunities answered at Achievement (or higher)</p> <p>OR</p> <p>Total of SIX opportunities with THREE at Merit level or higher.</p> <p><math>7 \times A</math> or <math>3 \times M + 3 \times A</math></p>	<p>Total of EIGHT opportunities answered with FIVE at Merit (or higher) and THREE at Achievement level.</p> <p><math>5 \times M + 3 \times A</math></p>	<p>Total of TEN opportunities answered with TWO at Excellence level [with at least ONE from 1(e) or 2(e) and at least ONE from 1(c), 2(d) or 3], FOUR at Merit level and FOUR at Achievement level.</p> <p><math>2 \times E + 4 \times M + 4 \times A</math></p>